

Android Application for First-Aid on Cloud-Powered Middleware Platform

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Abstract: Usually patients go to the hospital and there by consulting the doctor for their problem to get the solution regarding that. The work details of state-of-the-art architecture of the cloud-based middleware that is built and tested for real-world use following four methodologies namely: reflective, tuple space, context-awareness, and event-based. The system focuses on supporting patients to self-regulate wounds and immediate first-aid in occasion where instant reaction is needed. If patients have any query about the health problem, they will send the query and get the information about how to manage the situation like heart attack, snakebite, haemophilia, etc which needs immediate reaction. This involves bi-directional exchanges of the Electronic Health Record (EHR) amongst patients and the care facility. In any case, mobile phones rely on wireless communication channels(e.g., Wi-Fi, 3.5/4G, et cetera.) to transmit data and these channels can experience sporadic disconnections due to bandwidth fluctuations and user mobility.

Keywords: EHR(Electronic Health Record), Mobile devices, Cloud computing, Middleware.

Introduction

Mobile devices are used in various emergencies. They exchange data and information through wireless media such as Wi-Fi, Bluetooth and 3.5 / 4G. While there has been a steady increase in mobile device performance, communication means challenges. Through mobile technology, it became an easier way for doctors to communicate efficiently with patients and this provides a strong relationship between patients and doctors, as comments are often exchanged after treatment.

The mHealth area is under the condition that technological integration in the health sector has the potential to promote better health communication to achieve healthy lifestyle, to improve decision-making by healthcare professionals (and patients). and improving the quality of medical care. and facilitates direct communication in places where this was not possible before.

The document will provide accurate information on how you act immediately when the person has called haemophilia, heart attack, snake bites, etc., using an Android application

M-MEDICAL is a mobile self-assessment tool that allows a person to respond immediately. The information provided in the mobile application. In case of important scenes or serious health problems consult your doctor.

Our first application in the real world, which is self-control in first aid and the proposed methodologies, reveals the flexibility of the framework

to support clinical progress. Other services of computer brochures and findings of this work are:

- A cloud-based middleware platform that supports the real-world implementation of an mHealth application was created.
- The middleware is based on four improved methodologies, namely: reflective, tuple space, context, as discussed earlier.

Literature Survey

Facilitating Multi-Device Usage in mHealth

Richard K. Lomotey et.al(2012) suggested the architecture based on advanced technologies such as: the publication / subscription technology for real-time data access, medical data encryption for security and caching on mobile sides. The high dependency of wireless communication channels by mobile devices limits user expectancy, as consistent connectivity cannot be guaranteed by intermittent connectivity losses in mobile ecosystems. What is even challenging is the presence of the CAP theorem, which states that although the following three properties are desirable in a distributed environment: consistency, availability and partition tolerance, only two of the features can be guaranteed at the same time.

ARMISCOM: Autonomic Reflective Middleware for management Service Composition

In the composition of the service, failure of a single service causes the distribution of errors in the other services involved, and therefore fails in the system. Such malfunctions can often not be detected or corrected (single service), so it is necessary to develop architectures to diagnose and correct errors, both at individual (service) level and at global level (composition level). Middleware, and mainly reflective middleware, have been used as a powerful tool to handle the intrinsically heterogeneous nature of distributed systems with more adaptability. Juan Vizcarrondo et.al(2012) diagnosis of dysfunctions is made by the interaction of the diagnosis present in each work, and recovery strategies are developed by consensus of each technician equally divided into each service composition.

Introduction of the medical emergency team (MET) system: a cluster-randomised controlled trial

Unexpected deaths and cardiac arrests that occur in hospitals are often preceded by warning signs. Similarly, unplanned access to intensive care units (ICU) are often presented by abnormalities in the vital symptoms of patients without appropriate measures. These findings suggest that some of these adverse outcomes can be prevented. A hospital-wide approach to the treatment of patients at risk of sudden death and cardiac arrests through early recognition of impairment and early resuscitation is designed to reduce the number of unexpected deaths, cardiac arrests and admissions in ICU. The approach made by K.Hillman(2005) is based on the Emergency Medical Equipment (MET) system, which includes the training of staff, the introduction of MET call criteria, a greater awareness of the dangers of physiological instability and the immediate availability of a market economy. . The reason for this approach is that early intervention in response to physiological instability can prevent further deterioration in many patients. In studies that have had a limited analysis of a MET system is associated with a reduction in ICU admissions, cardiac arrest and death. To evaluate the solid MET system, a person should have undertaken a cluster randomized controlled study in 23 hospitals in Australia and examined the effectiveness of the system in hospitals of different sizes and characteristics of the organization.

Findings of the First Consensus Conference on Medical Emergency Teams

Studies by Michael A. DeVita et.al(2006) have shown that physiological instability and services do not coincide before side effects in hospital patients. In the considerations of the response report, the Concept of a Rapid Response System (RRS) has been produced. The responding team is commonly referred to as the Emergency Medical Team (MET), Rapid Response Team (RRT), Ordinary Care Scope (CCO). Studies show that ERS can improve the outcome, but there are still doubts about the benefits, design elements and advice of a MET system to implement.

System Architecture

The generic architecture unrecognizable first aid recognition tool (M-MEDICAL?) Emulate the mHealth is shown in Figure 1. It is a 2 stage architecture where the patient or the nearby person enters the symptoms of the patient and the database in the cloud giving back the tips and medicine prescribed by the doctor. Each prescription given by the doctor is stored in the database using queries. In this they work, the mobile devices connect to the back end via Wi-Fi or 3.5 / 4G connections. A middleware is proposed that maintains the coordination of the medical data synchronization process in the mHealth environment. The fact that wireless devices connect to the back end wirelessly ensure intermittent loss of connectivity. When managed incorrectly, the situation may lead to inconsistency of clinical data between the mobile versions of the data. For example, the ability to know if the most recent data regarding a current injury or non-problematic as the order in which their clinical data is not in the exact order of presentation. This ideal situation of order of arrival of data via HTTP does not occur in mobile networks and must be dealt with deliberately. This means that you minimize two issues looking for latency in the mHealth, and the ability to synchronize mobile health data efficiently and cost the minimum performance.

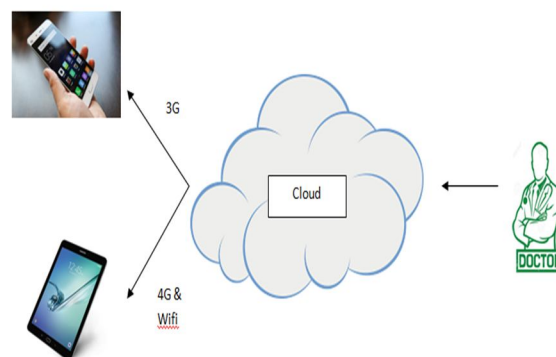


Figure 1. Architecture

Technologies

Intel Core "i3":

Intel intends Core i3 and the new lower end of Intel's performance processor line after the retirement of the Core 2 brand. The first Core i3 processors were launched on January 7, 2010. The first i3 Core based on Nehalem was Clark Dale-basa, with an integrated GPU and two cores. The same processor is also available as Core i5 and Pentium, with some other configurations. Hence it is user friendly for the programmer.

Android XML

All elements of the UI in an Android application are created with the View and ViewGroup objects. A view is an object that draws something on the screen that allows the user to interact. A ViewGroup is an object that contains their Objects (and ViewGroup) objects to define the interface design.

Android provides a collection of display and visual display submenus that provide common input controls (such as buttons and text fields) and various design models (such as linear or relative design).

MySql

MySQL is an open source relational database management system (RDBMS) based on structured query language (SQL).

MySQL works on almost all platforms, including Linux, UNIX and Windows. Although MySQL can be used for a wide range of applications, it is often associated with web-based applications and online publications and is an important part of an open source business stack called LAMP. LAMP is a web development platform that uses Linux as operating system, Apache as the web server, MySQL as the relational database management system and PHP as the object-oriented scripting language. (Sometimes Perl or Python is used instead of PHP).

Jdk 1.6

In our project, we use Java to design the application process. Java contains technologies such as JEE (Servlet, Jsp) that are used to easily design the watch page. As Java is an open source and an independent platform, this makes the application more flexible.

ADT(plugin)

Android Development Tools (ADT) is an add-on for Eclipse IDE that extends Eclipse's capabilities to quickly configure new Android projects, create an application user interface, adding the packages based on the Android Framework API, correcting the errors in the applications using the Android SDK tools, and also exporting signed .apk files (or unsigned) in order to distribute an application.

SDK

The Android SDK separates tools, platforms, and other components into packages that you can download through the SDK Manager. For example, when there is an updation of SDK Tools or a new version of the Android platform is released, usage of the SDK Manager is to quickly download them to corresponding environment.

Hidden Markov Model

This synchronization algorithm is an adaptation of the Hidden Markov Model (HMM)[C. Decomain et.al(2001)]. The HMM operates as a finite state machine, so it is necessary to specify a start state of a particular mHealth transaction. Given a mHealth A transaction by a particular user, is there a conditional chance that the transaction or dependency B operations of other HIRT users exist? or the same user can be expressed earlier as:

$$f_{A|B} = \frac{f_{A,B}(a_i, b_j)}{f_B(b_j)}$$

The condition of the existence of previous mHealth operations by M-MEDICAL, the users can be independent and arbitrary, which follows:

$$f_{A|B}(a_i, b_j) = f_A(a_i) \times f_B(b_j)$$

We have a series of random variables A_0, A_1, \dots, A_n , with values a set $S = S_0, S_1, \dots, S_n$. Then the order is Markov Chain if $\forall n \geq 1$ and $j_0, j_1, \dots, j_n \in S$ holds:

$$P(A_n = j_n | A_0 = j_0, \dots, A_{n-1} = j_{n-1}) \\ = P(A_n = j_n | A_{n-1} = j_{n-1})$$

given the position i on a specified t, a series of clinical transactions (known as terms cards) o and λ model can last:

$$P(A_t = i | \mathbf{o}, \lambda) = \frac{\alpha_i(t)}{\beta_i(t)}$$

Algorithm

Search Algorithm: In computer science, a search algorithm, is an algorithm that collects information stored in a data structure. Data structures can contain linked lists, arrays, search trees, hash tables, or other storage methods. The correct search algorithm often depends on the data structure that is searched. The query also contains algorithms that ask for the data structure, such as the SQL SELECT command.

Results

Login Page

The module is designed to develop login and signup screen. Android used xml to develop classical screens in our application. The modules describe signup page contains phone number or user name, password and conform password those kind of details should be stored in database. Login screen contains phone number or username and password when the user/admin to login the app it should be retrieve the data to the database and combine based on user input if its match user name and password to allow in the app otherwise alert and show a message to the user/admin.

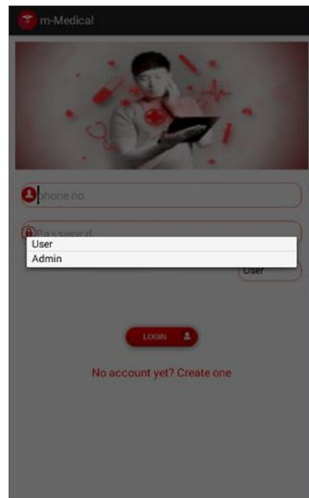


Figure 2. User/Admin Login page

Add Medicine

The module suggests the Doctor to add the medicine with the injuries name, age, symptoms and medicine quantity if the details are already inserted by the doctor then it will shoe some errors.



Figure 3. Add Medicine

Search Medicine

The module enables user or patients to search the medicine by giving the injury name , age and symptoms level. After the search , if the database have any medicine for the user injury it will show the medicine and if they have any doubt they can call to the doctor by clicking the call button. If there is no result the user question will be send to the doctor.

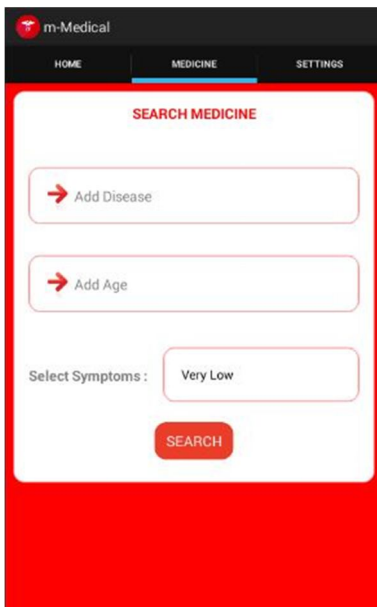


Figure 4. Search Medicine

Output



Figure 5. Output

Conclusions

M-MEDICAL, an emergency application mostly for patients who are in need of an immediate action for their minor injuries, is a concern for health services globally. The clinical challenge is how to enable patients to self-manage their injury. Our work, Tool (m-medical) is the real-world application on self-injury management in the emergency domain. This evidence-

based self-management mobile tool helps patients assess an injury and made them to realize how faster to seek medical attention. It supports a person with minor injury to make decisions based on his own assessment of physical signs and symptoms. It also suggests signs that indicate that the injury is getting worse and that there is no need contact them to prevent long-term problems. In this work, we address mobile health record synchronization issues by proposing a cloud middleware layer that tracks the activities of the users.

Future Scope

Future updation will be the provision of Online chatting, video calling and which are used to get the details within minutes using Human Segmentation Algorithm.

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